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dispute. One does not always see how the author has been guided in the selection of papers by foreign writers. From the list of over one hundred titles of papers published by Smith Woodward prior to 1900, sixty-nine are recorded. We can only be thankful that so many are given.

The geological survey is to be congratulated upon the publication of the work ; but we cannot help wishing that the printer had left the leaves untrimmed.

S. W. W.

Evolution of the Northern Part of the Lowlands of Southeastern Missouri. By PROFESSOR C. F. MARBUT. *The University of Missouri Studies*, Vol. I, No. 3 (Columbia), July, 1902. viii + 63 pages; plates I-VII.

THE paper is of more than usual interest to physiographers in that it presents in a comprehensive way the history of an extremely interesting locality. It is divided into Parts I and II, the former treating of the geography and geology of the region, and the latter of its physiographic development.

The writer abandons his former ideas of the origin of Crowley's Ridge,¹ and agrees, in the main, with the views of Dr. Branner, published several years ago, while state geologist of Arkansas.² It is shown that the lowland north and west of Crowley's and Benton Ridges, which is spoken of in the paper as the Advance lowland, was formed by the Mississippi at a time when it turned westward at the present site of Cape Girardeau and flowed past Delta, Poplar Bluff, and Neelysville, Mo., and Pocahontas, Powhattan, and Newport, Ark. While the Mississippi was forming the Advance lowland, the Ohio was eroding the broad valley between the eastern edge of Crowley's Ridge and the uplands of western Tennessee, and which the author calls the Cairo lowland.

While the Mississippi is the larger of the two streams, it has twice been captured by the Ohio. The capture of the larger stream by the smaller was made possible by the latter having the lower flood plain. The first capture was effected by a small tributary of the Ohio, working its way headward, through what was then a continuous ridge separating the two great rivers, along or near the present course of Little River; the second, by another small tributary working its way northward from

¹ *Proc. Bos. Soc. Nat. Hist.*, Vol. XXVI (1895), pp. 479-88.

² *Ann. Rep. Geol. Sur. Ark.*, Vol. II (1889), preface, p. xiv.

the present site of Commerce to where Gray's Point now stands. As a result of this, the Mississippi abandoned the Advance lowland at its eastern end and assumed its present course.

Other cases of capture of smaller streams are described in detail, which make interesting reading for the student of physiography.

The time of the lowland formation was the interval between the first and second glacial epochs.

Altogether it is an admirable piece of work. There are two points of courtesy, however, upon which the paper is open to some criticism: The discrediting of the published views of Dr. Branner upon the subject of the paper, and the underestimating of the maps of the region, published by the Mississippi River Commission. When in 1895 the author advocated a different theory regarding this drainage,¹ Branner's views were duly considered and promptly upset; now that Branner is found to be correct, his theory of the origin of Crowley's Ridge is spoken of as being "merely a statement of the popular view." The true theory of the ridge's history may be the popular one in Missouri, but the present writer has reason to believe that it is not the popular one in Arkansas even today. Again, Professor Marbut says that Dr. Branner's statements "lay no claim to scientific completeness." This is true; but it should be noted that Dr. Branner published his ideas, not in the body of the report on Crowley's Ridge, but in the preface to the report. The report itself was written by Professor Call, an assistant on the Arkansas Geological Survey, with whose ideas as to the origin of the ridge Dr. Branner did not agree; and not agreeing, justice to himself required him to say so, but at the same time good taste and expediency forbade a full discussion of the matter at that time and place. The present writer happens to know that the data collected by the late Arkansas survey on the history of Crowley's Ridge would fill a good-sized volume. While Dr. Branner's treatment of the subject made no pretense of being exhaustive, his statements were based upon a large amount of data at his command. The author likewise says that when he undertook the work on the region "no sort of topographic map of this part of the lowlands was in existence." The map published with the Crowley's Ridge report of the Arkansas Geological Survey, and the map of the Mississippi River Commission from which the Arkansas map was largely compiled, so far as their portrayal of the physiographic history of the region goes, are in all essen-

¹ *Loc. cit.*

tials relating to the questions discussed, like that published by Professor Marbut, Plate VI of his paper.

Again, the present writer wishes to express his appreciation of Professor Marbut's paper as an interesting and detailed account of physiographic changes, the main features of which were already known.

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Ensayo de una bibliografía histórica i jeográfica de Chile. Por NICOLAS ANRIQUE R. I L. IGNACIO SILVA A. Santiago de Chile. 1902. 8vo, xix + 679 pages.

THIS work is of the first importance to all students of the history, geography, and geology of Chile. It contains 2,561 titles, to many of which are added brief but valuable annotations. The bulk of the works listed are in the Spanish language, but there are many in German, French, and English. The first 996 titles relate to the history of Chile; the remaining 1,565 relate to its geography, including topography, hydrography, seismology, meteorology, travels, geology, paleontology, and mineralogy. The introduction to the second part contains a sketch of the physical geography of Chile. The author observes that the number of Chilean volcanoes has been greatly exaggerated. A list of them is given, with their latitudes, elevations, and dates of last eruptions. This list mentions forty volcanoes, for several of which no eruptions have been reported. The second part of this introduction devotes eleven pages to the meteorology and climate, under which are included earthquakes, the most important of which are listed. The third part of the introduction treats briefly of ethnographic geography. In spite of numerous oversights and omissions this is one of the most valuable publications made of late years in Chile and it is to be hoped that it will be turned to abundant account by our students of both political and natural history.

J. C. BRANNER.

STANFORD UNIVERSITY,
California, November 4, 1902.